

pam

WF 200

1911

B24d

ET IN TUBERCULOSIS,
WITH COSTS OF FOODS AND
THEIR PREPARATION

BY

NOEL DEAN BARDSWELL

M.D., M.R.C.P. and

JOHN ELLIS CHAPMAN

M.R.C.S., L.R.C.P.

PRICE TWO SHILLINGS NET

LONDON

Y FROWDE

HODDER & STOUGHTON

IVERSITY PRESS

WARWICK SQUARE, E.C.

1911



22200100456

DIET IN TUBERCULOSIS,

WITH COSTS OF FOODS AND THEIR PREPARATION

BY

NOEL DEAN BARDSWELL

M.D., M.R.C.P. and

JOHN ELLIS CHAPMAN

M.R.C.S., L.R.C.P.

LONDON

HENRY FROWDE

HODDER & STOUGHTON

OXFORD UNIVERSITY PRESS

WARWICK SQUARE, E.C.

1911

12346341

WELLCOME INSTITUTE LIBRARY	
Coll.	welM0mec
Cali	pam
No.	WF 200
	1911
	B24d

DIET IN TUBERCULOSIS

TUBERCULOSIS is one of the wasting diseases, and the rationale of its treatment consists in improving general nutrition, repairing waste, and in increasing what we know as the resistant and recuperative powers of the human body ; in this treatment dietetics form one of the most important factors at our command. It is not a simple matter to generalize when speaking on the subject of the dieting of tuberculosis. The disease may manifest itself in such varied forms ; it may be very acute, for example, as a general infection, or the morbid process may be quite localized and give rise to little or no constitutional symptoms ; very often, as in the case of pulmonary tuberculosis, for instance, the disease runs a protracted and chronic course with intervals of more acute exacerbations. The signs and symptoms, then, of tuberculosis differ considerably, according to the character of the infection, and the part, or parts, of the body affected ; for this reason, the dietetic indications in patients suffering from this disease may vary a good deal. The diet, for example, which is in every way adequate for a patient with a limited and quiescent lesion in the lung, and whose body weight is in excess of his normal, will usually be found to be quite unsuitable for a patient with extensive and active disease in the same situation, associated with high fever and general constitutional disturbance. Tuberculosis of the larynx, associated with dysphagia, and the common complication of consumption, hæmoptysis, both require special dietetic

treatment; tuberculosis of the intestines and kidneys, and the various dyspepsias due to tubercular infection, also have their special dietetic indications. Speaking generally, the principles underlying the dietetic treatment of all types of tubercular disease are the same, but in the case of disease of certain organs, there are special indications to be considered. We may, then, conveniently discuss the subject of dietetics in tuberculosis in two sections (1) the dietetic treatment in tuberculosis generally, and (2) the special dietetic indications in tuberculosis of various organs.

THE DIETETIC TREATMENT IN TUBERCULOSIS GENERALLY

Our researches upon the dietetics of tuberculosis have been carried out in the course of some eight years' residence in sanatoria for the treatment of this disease. The patients we have treated, although they have been for the most part patients suffering from pulmonary tuberculosis, have included a good number of those suffering from tuberculosis of other organs, more especially of the larynx and of the intestines; a fair proportion of cases of surgical tuberculosis, such as bone and joint disease, lupus, etc., have also been observed. Our conclusions, then, as to the broad lines upon which the dieting of tuberculosis should be based have been formed as the result of observations upon a large number of patients suffering from tuberculosis in various regions, and for this reason we think that they may be taken as having a general application in the treatment of the disease. Opinions as to the best principles upon which diets for the treatment of tuberculosis should be constructed have differed very much, and at the present time the practice of physicians in this respect

varies very considerably. An interesting illustration of the fact is afforded us by the statistics collected by Irving Fisher of Newhaven, in America, for the annual meeting of the National Association for the Study and Prevention of Tuberculosis held at Washington in May, 1906. The results of his inquiry are published in the *Transactions* of this Society (1906). Fisher states that "Letters of inquiry were sent out to 95 of the leading sanatoria of the world of which 63 were in the United States, 2 in Canada, 13 in Germany, 11 in Great Britain, and the remainder in France, Austria, Norway, Switzerland, and Russia. Very few" (less than 20 apparently), he continues, "supplied any measured data, and in most cases the statement of the food consumed was given only in a general way."

In regard to the question of the quantity of food consumed, Fisher found that of 64 sanatorium physicians, 28 were distinctly in favour of the system of forced feeding, and 29 were distinctly reactionaries against it. In the table of measured data which will be found in Fisher's Appendix, it will be seen that the dietaries range all the way from 2,500 calories to 5,500 calories, and have a protein value of from 160 to 300 grammes. Commenting on these facts, Irving Fisher writes: "Naturally, not all of these standards can be correct, and if we are to believe that there is any virtue in physiological economy, we must conclude that those sanatoria which use the lowest standards consistent with weight-gaining must be more nearly on the right track."

In conclusion, Fisher sums up the present position with regard to the question of the dieting of consumptives in the following words: "There is as yet very little known with certainty as to the most efficient diet in the treatment of tuberculosis or the extent to which this diet should be individualized. In order to determine either the stan-

dard or individual diet, much study and accurate observation are needed."

The object of our researches was to determine (1) the best principles upon which to construct diets for the treatment of tuberculosis and (2), if possible, to arrive at a standard diet suitable for the treatment of the average tubercular person.

We may say that it is clearly impossible to construct a dietary which is suitable for the treatment of all types of tuberculosis and for every individual sufferer from this disease. To attempt to do so would be to attempt as impossible a task as that of constructing a dietary which would be suitable for every one enjoying normal health, irrespective of sex, age, or occupation. However, in the same way as it has been possible as the result of prolonged scientific research and observation to formulate the essential principles upon which diets for normal individuals should be constructed, so it should be possible to determine the principles upon which diets should be constructed for the use of those suffering from tuberculosis. Further, it seems reasonable to assume that by continued accurate observations upon a large number of patients, a standard diet can be determined which is suitable for the treatment of the average tubercular patient, and which, with slight modifications, either by way of increase or decrease in some of its constituents, should be suitable for any individual suffering from this disease.

Method of observation.—Every patient on admission was carefully examined and observed for a day or two. This enabled us to estimate the extent and activity of the disease, and to ascertain the amount of fever present, the degree of emaciation, and to some extent the general constitution of the patient, and more especially the condition of his alimentary tract. We next estimated the nutritive

value of the diet which was physiological, i.e. adequate for the requirements of the individual patient when in normal health and up to his normal weight. We then constructed a diet for the patient, in which the chief constituents of his physiological diet, viz., protein, fat, and carbo-hydrate, were increased in certain definite amounts. During the course of our observations we varied the amounts of the increase in protein, fat, and carbo-hydrate considerably in different cases, and in many individual cases we observed their progress on diets of varying nutritive value.

As a matter of routine practice we increased the physiological diets of patients in the several chief constituents according to the degree of activity of the disease and the amount of emaciation present in any individual case.

In every instance the physiological diet for the individual patient when up to his normal weight and in normal health was taken as the basis for his sanatorium dietary. The diet as prescribed thus represented the physiological diet, with the addition of certain definite amounts of protein, fat, or carbo-hydrate. The diet prescribed was given to the patients in accurately weighed-out and measured amounts, and after the completion of every meal, any food-stuff that was left was also accurately weighed. By this means we obtained definite data as to the exact amount of the various foods taken by each patient throughout the whole course of treatment.

Careful clinical observations were always made with regard to the progress of the lung disease, alterations in body-weight, improvement in general health, etc.

In many cases, metabolic examinations were also made. Sometimes these observations were made during a four-day period once a month; in other cases, they were made daily for periods varying from a week to three months. The

points especially studied were (1) the absorption of fat and nitrogen, (2) the amount of excreted nitrogen, (3) the form in which the nitrogen was excreted, viz., whether simple or in the more highly elaborated form, and their percentage relation. (4) The amount of intestinal putrefaction as evidenced by the ratio between the aromatic and the alkaline sulphates excreted and the amount of indican.

General principles regarding increase of protein, fat, carbohydrate and calorie value.—Generally speaking, a person suffering from tuberculosis requires a more generous diet than is physiological for him when in ordinary health. There are, as has been already noted, three chief constituents of a diet, viz., protein, fat, and carbo-hydrate. The question is, in which constituent and to what extent should the increase be made? Some physicians with considerable experience in the treatment of tuberculosis advise that the increase be made in protein sparsers, especially fat, while others advocate a very generous increase of all the constituents. Our experience is that the morbid process clears up better and general health improves more rapidly when patients are treated with diets richer in protein than those usually taken in health. We have, for instance, in the case of patients whose progress has been somewhat stationary, noticed distinct improvement immediately follow the addition to their diets of more protein. In similar cases, when a comparable increase has been made in the carbo-hydrate and fat, the protein intake remaining the same, there has not been the same improvement. Theoretically, one might expect equally good results to be associated with the increased use of protein sparsers, and an actual increase of protein; in practice we have not found this to be so. It seems possible that the beneficial effects of an increased protein intake may be in part accounted for by the extractives contained in the

meat. We have found, however, that when using a diet containing no meat at all, and in which the protein is given chiefly in the form of milk, pulse and oatmeal—in which the amount of extractives is negligible—we obtain results as satisfactory as when prescribing protein chiefly in the form of meat. Protein produces a stimulating effect upon the general body metabolism, and thus has a beneficial influence upon general nutrition ; the value of an increased protein intake in the treatment of tuberculosis is probably thus explained.

With regard to the **amount of the increase of protein** we have observed the course of tubercular disease in a large number of patients treated upon diets containing daily amounts of protein ranging from 150 grammes to 250 grammes, and our experience has been as follows : excellent results both from clinical and metabolic stand-points have been obtained when using diets containing 150 grammes of protein daily. Increasing the intake of protein beyond this point, viz., 150 grammes daily, is not associated with any better clinical or experimental results ; on the other hand, we have found that large amounts of protein may do actual harm. Metabolic investigation shows that with a very large protein intake, a very large proportion of the nitrogen ingested is immediately excreted, and throws a considerable strain upon the alimentary and excretory organs, the amount of nitrogen excreted in less completely oxidized form is increased, and there is evidence also of increased intestinal putrefaction. Our experience is, then, that the increase in protein in any individual case should be some 25 to 30 per cent. on the amount of protein contained in his physiological diet ; this, on an average, works out at some 150 grammes daily.

Fat and carbo-hydrates.—The necessity for increasing the energy-giving foods of the dietary when treating tuber-

culosis has frequently been insisted upon, indeed, a good deal more stress has been laid upon this point than upon the desirability of increasing the protein. As a matter of interest, we would point out that the way in which the increase in energy-giving food is usually made, viz., by the addition of milk, means that a considerable increase is at the same time made in the amount of protein. In a large majority of cases of tuberculosis, it is undoubtedly desirable to increase the amount of energy-giving foods, especially so in the case of patients who have much fever or who are considerably below their proper body-weight. Fat is a less bulky form of energy-giving food than carbohydrate, and for this reason is much more readily taken; a patient with anorexia will take a considerable amount more nourishment in the form of fat than in the form of carbohydrate. Fat, then, is rightly recognized as a very valuable item in diets for the tubercular. Fat, also, by experimental observations, we have found to be extremely well absorbed, even by patients with high fever and acute constitutional symptoms; for example, 96.4 per cent. was absorbed by a patient who took 231 grammes of fat daily. An increase of energy-giving foods beyond a certain point is prejudicial, just in the same way as an increase of protein beyond a certain point does harm rather than good. The taking of an excessive amount of fat and carbohydrate results in the putting on of too much body-weight, largely in the form of fat, a condition which is associated with dyspnoea, flabbiness, poor general muscular tone, and often anorexia and dyspepsia.

It is difficult to state the amount of the increase which should be made in fat and carbohydrate, as this depends a great deal upon the amount of physical exercise which the patient is allowed to take, as well as upon the other factors which we have previously referred to. On an

average, the tubercular patient at physiological rest, viz., not engaged in actual muscular exertion, appears to do best upon a diet which represents an increase of 30 per cent. in total calorie value upon his physiological diet. On diets of such a value, and assuming that the protein value has been increased 150 grammes, our patients have regained lost weight at the rate of from 1-2 lb. a week until they are a few pounds in excess of their normal body-weights, a condition which is usually associated with all-round satisfactory progress. In the case of tubercular patients who have quiescent lesions and are restored in general health, and who may be engaged in actual manual work, a still larger amount of energy-giving food will be required ; for example, to patients with arrested pulmonary tuberculosis engaged in heavy gardening work such as digging, we prescribe diets with a calorie value, up to 4,500 grammes, with most satisfactory results. A very fair and "rough and ready" guide, as to whether a patient is taking a proper amount of energy-giving food, is given us by his weight. A steady gain of weight of from 1-2 lb. a week in the case of a patient with active disease who is considerably below his weight is satisfactory. A steady increase of body-weight in the case of a patient already some pounds in excess of what is deemed his normal body-weight, is an indication that he is taking too much energy-giving food, or not taking sufficient exercise. Our practice is to make a reduction of 15 per cent. in the energy-giving foods when a patient has reached a body-weight slightly in excess of his normal.

To summarize, then, the general principles for the dieting of the tuberculous are as follows :—

1. The amount of protein in the physiological diet should be increased by 30 per cent., and this increase should be maintained until the disease is obsolete.

2. If the patient is under weight, the physiological diet should also be increased 30 per cent. in the purely energy-giving foods, viz., either in fats or carbo-hydrates, or partly in each. This increase should be maintained until the weight becomes stationary at a point a few pounds in excess of the patient's highest known weight before becoming infected with tuberculosis.

A decrease of 15 per cent. may then be made, and the diet, thus altered, should be continued until the disease is obsolete.

Individual and class habits will determine the relative amounts of fat and carbo-hydrate prescribed.

3. Patients with constitutional disturbance associated with anorexia or dyspepsia usually require a somewhat concentrated diet, so as to give the comparatively large amount of nourishment in a but slightly increased bulk of food-stuffs.

4. The meals should be well cooked, varied, and given as far as possible at considerable intervals, and reliance should be placed upon plain food-stuffs whenever possible ; invalid food should only be used when ordinary foods cannot be taken.

THE STANDARD DIET

To arrive at a standard diet suitable for the treatment of the average adult suffering from tuberculosis, we have worked out the average nutritive value of the diets taken by 200 of our patients who made very satisfactory recoveries. We have, in this analysis, considered the diets taken by the men and women patients separately, and from them we have calculated the standard diet for each sex respectively. The 200 patients by whom these diets

were taken, as has previously been mentioned, represented many types of tubercular disease both as regards the exact nature of, the extent of, and the severity of the morbid process. The nutritive value of the average diet taken by the men patients works out at approximately 150 grammes of protein and 3,200 calories daily, the average diet taken by the women at 128 grammes of protein and 2,700 calories. These are standard working diets, and as such will be found very useful, and to give very satisfactory clinical results. They will, of course, require modification in individual cases; for example, a man of large physique will require quite 10 per cent. more protein and 20 per cent. more calorie value than a small man, other things being equal. As a matter of experience, however, we do not often prescribe to patients with active tuberculosis diets with a lower nutritive value than those of our standard dietary.

It is of interest to compare our standard diets with the standard diet worked out by a careful observer on this subject, Dr. H. M. King of the Loomis Sanatorium in America. In his paper, "Diets in Tuberculosis" published in the *Transactions* of the National Association for the Study and Prevention of Tuberculosis (Washington, 1906), Dr. King thus describes his observations:

"With a view of establishing a working diet, so to speak, for certain classes of tubercular invalids, the following experiment was recently made at the annex of the Loomis Sanatorium. Twelve patients equally divided as to sex were selected with reference—first, to similarity of conditions, all but one with quiescent or arrested lesions, and that one with but a very moderately active lesion; secondly, with reference to similarity of weight, the men averaging 11 or 12 kilos more than the women; and thirdly, with reference to a close approach of each patient to his or her normal weight. In all but one case the patients

were but slightly below the indicated standard; nevertheless, the appearance was that of a very well-nourished group of individuals. These patients were placed at a table by themselves, and their food, while not differing from that of the other patients, either in quality or quantity, was accurately weighed and recorded for a period of 14 days. The average diet taken by these patients throughout this period worked out at 166 grammes protein, 179 grammes fat, 322 grammes carbo-hydrate, with a calorie value of 3,667."

Commenting on this average diet, Dr. King states that "This dietary has seemed to us to meet in a fairly satisfactory manner the requirements of the class of tuberculous invalids treated in the annex division of the Loomis Sanatorium. Nevertheless, I felt that the protein constituent of the dietary has been in excess of the tissue needs, and if so, that an unnecessary and perhaps harmful tax was thus imposed upon the organs concerned in protein metabolism and elimination."

The diet taken by King's patients at the Loomis Sanatorium is somewhat larger than our standard diet for men, both in protein and calorie value, the average daily intake of protein in King's diet being 166 grammes compared with 150 grammes in our standard diet.

	Grains of Protein.	Cals.
King's Standard diet	166	3,667
Our standard diet for men	150	3,200

In a letter to us on the subject, King writes: "The question of establishing the minimum protein food constituent which would give a plus nitrogen balance in cases of tuberculosis is of much interest to me, and I have not by any

means reached satisfactory conclusions with regard to it. For the present, the average diet which we find, for practical purposes, most useful, is almost identical with that which you quote as having been found most satisfactory with you, except that we probably average a greater consumption of carbo-hydrates, bringing the total calories to from 3,000 to 3,700."

ON THE TREATMENT OF TUBERCULOSIS WITH VERY LARGE DIETS, OFTEN SPOKEN OF AS FORCED FEEDING

The treatment of tuberculosis, especially of pulmonary tuberculosis, with very large diets has been so frequently advocated, and is still so widely practised, that it is necessary to refer to it.

The routine treatment of consumption with diets of a very high nutritive value is very often associated with most satisfactory clinical results, as evidenced by arrest of the tubercular process and restoration of health and strength, although this method of treatment results in a considerable strain being thrown upon the digestive system and the body metabolism. In the case of patients who have good constitutions, and especially good digestions, continued high feeding may produce no permanent and indeed little or no temporary ill-effects, except some dyspnoea due to excess of body-weight. Such a patient becomes obviously too fat, often a stone or two above his normal weight, but his digestive and excretory organs may successfully cope with the strain imposed upon them. On return to ordinary life, on completion of his course of treatment, such a patient loses a good deal of his excess weight,

and the net result may be satisfactory enough. In many instances, however, and notably in the case of patients with naturally weak digestions and in those who continue the high feeding for a long time after their normal body-weight has been well exceeded, the taking of a very large diet is attended with very serious disadvantages. One of the earliest symptoms is failure of appetite, amounting to a positive loathing of food; very often also there is flatulent dyspepsia.

This impairment of the alimentary system is often associated on exertion with a degree of dyspnoea out of all proportion to the extent of the lung disease; this dyspnoea is no doubt due to the loss of the physiological balance between the cardio-respiratory functions and body-weight. An individual in such a condition looks obviously too fat, and not infrequently, in addition to some degree of anorexia and flatulent dyspepsia, he complains of a feeling of heaviness throughout the day, but especially marked after meals, and a general inaptitude for physical and mental exertion. If the administration of very large diets be continued after the condition just described has been established, vomiting and diarrhoea may follow, representing, as Sir Douglas Powell suggests, "the attempts of nature to rectify our want of foresight." The result is that the individual, for a time at least, takes a smaller diet and loses some weight, and his alimentary tract benefiting from this rest usually soon recovers its normal tone. It is to be said in favour of the system of continued very high feeding that, in spite of the discomforts and digestive disorders from which many patients suffer when thus treated, it often results in the tubercular disease becoming arrested. Excessive feeding is clearly a vastly better method of treatment than under-feeding, for it at least ensures the patient taking enough to repair his waste. The point to

realize is that such over-feeding is quite an unnecessary hardship for a patient to undergo, and that it may do positive harm.

ON THE CONSTRUCTION OF DIETS HAVING THE SAME NUTRITIVE VALUE AS OUR STANDARD DIETS

The diet prescribed to patients suffering from tuberculosis should contain the food-stuffs generally used by people in ordinary life. To construct any dietary of a certain definite nutritive value it is necessary to have a knowledge of the percentage composition of the various food-stuffs contained in it.

The following table gives the approximate nutritive values of the food-stuffs commonly used and will be found of considerable practical value. The analyses of the uncooked foods are taken from Attwater's tables. The nutritive value of the cooked foods mentioned in the table we have ourselves determined by a series of analyses.

Approximate Nutritive Value per Ounce of Food-stuffs.	P. Grammes.	F. Grammes.	C.H. Grammes.
Beef, roasted as served	7	2	—
Mutton, game, chicken, etc.	6	1	—
Boiled fish	4.5	1	—
Raw meat, scraped	4	Trace	—
Milk puddings, blanchmange, custard, etc.	1.2	1.2	4
Boiled suet puddings	1.7	3.6	14.2
Boiled potatoes	0.6	—	6
Eggs	6	4	—
Bread and cake	2.3	—	14
Butter, dripping, margarine, etc.	—	2.2	—
Milk (per oz.)	1	1.2	1.5
Benger's food (made entirely with milk)	1.2	1.2	3.4

Milk.—Milk is a very valuable food-stuff, since by its use a considerable amount of nourishment can be prescribed in a very easily-taken form. The inclusion of 3 pints of milk in a patient's dietary means that a third of the necessary protein and calorie value is thus given. Milk, however, is not an essential constituent of the diet, especially in the treatment of patients who have normal digestions and can take solid foods. When, on grounds of economy, milk is not advantageously included in the diet, the patient does perfectly well, so long, of course, as the nutritive value of his diet is kept up to the requisite standard.

When whole milk cannot be afforded, use should very often be made of skimmed, or separated, milk.

It must be admitted that whole milk is much more palatable than separated (or skimmed) milk, but, at the same time, separated milk, as a drink, is by no means so unpalatable as to contraindicate its use. The main use, however, for which we recommend separated milk is in cooking.

In puddings it is almost impossible to distinguish those made with whole milk from those made with separated milk.

Again, separated milk can be used advantageously in making cocoa, oatmeal porridge, and, in general, most articles which require milk.

It may be said that the use of separated milk, which is confessedly of lower nutritive value, bulk for bulk, than whole milk, lowers the nutritive value of the diet. This is, of course, quite true, but it is of little or no importance to the healthy man, who can make up the deficiency easily enough in other ways. In the case of persons with poor appetites, the fat lost by separation can readily enough be restored by the use of an equivalent amount of margarine, which, for cooking purposes, is quite as satisfactory

as butter and less expensive. A gallon of whole milk loses 168 grammes of fat by the process of separation, and this 168 grammes of fat costs 8*d.* One hundred and sixty-eight grammes of fat, in the form of the best margarine, costs about 3*d.* In other words, we save 5*d.* per gallon if we use separated milk and margarine in place of whole milk without affecting either the nutritive value in the slightest degree or the palatability, provided the materials are used for cooking only.

These economic properties of milk, though not generally made use of, appear to us to be worthy of the consideration of those responsible for the construction of dietaries for the poor.

Meat.—Meat should always be included in the dietary as one of the chief sources of protein. Meat, also, is not an essential, when treating patients with normal appetites and digestions; we have obtained excellent clinical results when treating tubercular patients upon entirely meat-free diets, in which the protein was given in milk and vegetable foods. These meat-free diets, though very cheap, are difficult to make really palatable and, in the long run, it is better economy to include a certain amount of meat.

The amount of meat included in the average standard dietary should be quite reasonable, viz., from 9–12 oz. of meat, as purchased daily. An ill-balanced diet containing a large excess of meat, is as prejudicial to the tubercular as to the normal individual. In some cases with marked dyspepsia or high fever, and also in tuberculous enteritis, we have found raw meat to be very beneficial; this may be, in part, accounted for by raw meat being very easily, and completely, absorbed by the alimentary canal.

When prescribing raw meat, there is some risk, however, of introducing parasites.

Cod-liver oil, etc.—Cod-liver oil, malt and oil, etc., are

to be considered more in the light of food-stuffs than of drugs. They have a very distinct value, especially in private practice, as the amount of fat given daily can be readily increased by prescribing them as a medicine to be taken with meals. It is quite possible that these oils have a beneficial effect, quite apart from their food value, but this point is uncertain.

In sanatorium practice they are but rarely used, as fat can be given in adequate amounts in more palatable ways, for instance, in butter and milk. Oils are very valuable indeed in the dieting of tuberculous children, as they are readily taken by them. In the case of out-patients, also, they are a very useful means of increasing the value of the diet.

Alcohol.—There is a considerable difference of opinion as to the value of alcohol in the dietetic treatment of tuberculosis.

We do not advise the inclusion of alcohol in a routine diet for a sanatorium for tubercular patients or as a regular constituent of a tubercular dietary. Alcohol, however, is often of use; in patients with considerable debility, a glass of Burgundy, or some good wine with luncheon and dinner, often improves the appetite and digestion of such patients; in the case, too, of people who have always been used to a certain amount of alcohol, it is sometimes advisable to allow small amounts to be taken at the usual times. A glass of beer at meals in place of milk can often be given to convalescent patients with advantage. Alcohol is often of great service in treating patients who are acutely ill, or considerably exhausted; brandy, in doses of 1–3 oz. daily, in our experience is the most satisfactory form in which to prescribe it. In the treatment of night sweats, also, $\frac{1}{2}$ –1 $\frac{1}{2}$ oz. of brandy, given in hot milk, often gives great

relief, and not infrequently, the taking of such a draught in the early hours of the morning will altogether prevent the occurrence of this depressing symptom.

DIETS FOR THE LEISURED CLASSES

The diets prescribed to people suffering from tuberculosis should be as far as possible similar to those taken by the same individuals when in ordinary health; the nutritive value, however, must be somewhat larger—on an average, some 150 grammes protein and 3,200 calories daily. An examination of the diets usually taken by the leisured classes shows us that their average intake of 120 grammes of protein daily is taken approximately in the following way: in meat and fish, 60 per cent., in daily produce, such as milk and eggs, 16 per cent., the remaining 24 per cent. being taken as vegetable protein, for instance, in bread, potatoes, etc. Energy is mostly taken in the form of bread, cakes, pastry, etc., butter, puddings of various sorts (which contain milk, suet, eggs and butter in their composition), bacon, and, to a less extent, in fruit vegetables, jams, marmalade, sugar, etc. Approximately speaking, the proportion of fat to carbo-hydrate in the ordinary diet of the leisured classes is 3 parts of fat to 5 parts of carbo-hydrate. It will be remembered that fat is more expensive, but a more palatable and less bulky form of energy-giving food than carbo-hydrate; this fact explains the preference of the leisured classes for fat as a source of energy.

When constructing dietaries for use by tubercular patients of the leisured classes, the increase of 30 per cent. of protein and calorie value is best made by adding to an

average normal dietary the requisite amount of food-stuffs of a similar nature to those which are already included in the dietary. Supposing that on inquiry we find that any particular patient's diet when in normal health has been adequate from a nutritive standpoint, an addition of 3 pints of milk daily will often be sufficient to bring this dietary up to the necessary nutritive standard for the efficient treatment of tuberculosis. Three pints of milk means an addition to the dietary of

Protein.	Fat.	Carbo-hydrates.	Calories.
50	60	75	1,070

In short, of one-third of the diet necessary.

It must not be forgotten, however, in this respect, that the diets of patients when they are first found to be tubercular are often inadequate, the patient having unconsciously materially reduced his dietary in consequence of gradually increasing anorexia. The diet, then, of any patient when he first comes under observation very often does not represent the individual's ordinary diet when in normal health. This construction of a diet for the tubercular by the addition of 3 pints of milk to an individual's ordinary diet when in health is a very simple method and is often satisfactory; in actual practice, however, many people find some difficulty in taking an extra 3 pints of milk in addition to the milk they are already taking in tea, coffee, puddings, etc. The extra milk may be taken, a pint at each meal, or half a pint may be taken at each meal, the other three half-pints being taken at other times—preferably, perhaps on waking, in the middle of the morning, and in the middle of the afternoon, or the last thing at night. The majority of people prefer the latter method, viz., taking the milk in half-pints distributed over the day, but, in our experience, the one method is quite as satis-

factory as the other from a clinical standpoint. A certain number of people are unable to take milk in its natural form on account of dyspepsia and other alimentary disturbances which it gives rise to ; in some of these cases, the symptoms appear to be due to a real dyspepsia ; in others, and more often in people of a nervous temperament, the difficulty appears to be simply an idiosyncrasy. It is very rarely, however, that milk cannot be satisfactorily taken by these patients if its taste be disguised somewhat. The best methods of altering the milk are as follows : (1) by the addition to it of a small quantity of very strong tea or coffee ; (2) by making it into a rather fluid Benger's food preparation ; (3) by having it completely or partially pancreatized ; (4) by flavouring the milk with bovril, in the proportion of a teaspoonful of bovril to a half a pint of milk ; this last method results in a richly flavoured and very nutritive beef-tea, from which the taste of milk is absent. A certain amount of milk can be given in the shape of junket, custard, egg-flip, etc., but these preparations are only subsidiary, and must not be relied upon as the chief means of prescribing milk.

The value of milk, as a constituent of diets for the tubercular has long been recognized, and many people think that a dietary for a consumptive cannot be adequate and efficient if milk is not included in it. This, as already explained, is a fallacy. Milk, in short, has no specific value from a clinical standpoint.

Detailed description of diets for the leisured classes.—The following dietary has the nutritive value of our standard diet for the treatment of the average tubercular man, viz., protein 155, calorie value, 3,250.

	Protein.	Fat.	Carbo- hydrate.
	Grms.	Grms.	Grms.
Milk, 3 pints	57	70	87
Bread, 6 oz.	16	2	88
Butter, 1½ oz.	—	32	—
Cream, 1 oz.	1	6	—
Fish, 4 oz.	20	10	—
Meat, 6 oz.	44	22	—
Milk pudding, 4 oz.	9	16	50
Suet or sponge pudding, 3 oz.			
Potatoes, 5 oz.	1	—	30
Egg, 1	6	4	—
Stewed fruit, green vegetables, soups, etc., from time to time, q.s.	1	1	7
Cake, 1 oz.	1	2	12
Totals	155	160	275

Total calorie value 3,250.

In the above table the nutritive values of the majority of the food-stuffs have been calculated from the tables of the percentage composition of food-stuffs of Attwater, and in the case of the food-stuffs from original analyses.

In practice this dietary may conveniently be given in the following way :—

Men.		Women.
	BREAKFAST.	
Two breakfast cups.	Milk (usually flavoured with coffee).	Two breakfast cups.
Four ordinary-sized "triangles."	Toast (or bread).	Three ordinary-sized "triangles."
A piece the size of a walnut.	Butter.	A piece the size of a walnut.
One egg.	Egg.	One egg.
An ordinary sized helping.	Bacon, cold ham, tongue, a herring, or a fillet of fish, etc., etc.	An ordinary sized helping.
Four tablespoon-fuls.	<i>Porridge (in place of half the bread) and milk or cream.</i>	Three tablespoon-fuls.
A tumblerful.	11 A.M. Milk.	A tumblerful.

Men.		Women.
	LUNCH.	
A tumblerful.	Milk.	A tumblerful.
An ordinary sized helping.	Fish or <i>entrée</i> .	An ordinary sized helping.
2½ oz. (a large helping).	Meat.	2 oz. (a large helping).
Two, the size of a hen's egg.	Potatoes.	Two, the size of a hen's egg.
According to taste.	<i>Green vegetables.</i>	According to taste.
Half a round (thick).	Bread.	Half a round (thick).
A piece the size of a walnut.	Butter.	A piece the size of a walnut.
A large helping (4 or 5 oz.).	Milk or other pudding, stewed fruit and custard or creams, etc.	A large helping (3 or 4 oz.).
<i>Tea, a slice of thin bread and butter, and a piece of cake, pastry, etc.</i>	TEA.	<i>Tea, a slice of thin bread and butter and a piece of cake, pastry, etc.</i>
	DINNER.	
A tumblerful.	Milk.	A tumblerful.
If desired.	<i>Soup.</i>	If desired.
An ordinary helping.	Fish or <i>entrée</i> .	An ordinary helping.
As at lunch.	Meat.	As at lunch.
	Potatoes and vegetables.	
Half a round.	Pudding, etc.	Half a round.
A piece the size of a walnut.	Bread or toast.	A piece the size of a walnut.
If desired.	Butter.	If desired.
	<i>Savoury or cheese, etc.</i>	
	<i>Dessert.</i>	
	BEDTIME.	
A tumblerful.	Milk.	A tumblerful.

N.B.—The essential food-stuffs in the above dietary are printed in Roman letters; those which may be left to the discretion of the patient in italics.

Approximate value of the above diets:—

Men . .	155 protein	160 fat	275 carbo-hydrate.
Women .	135 protein	140 fat	230 carbo-hydrate.

If the above diets are compared with those taken by people in ordinary health, it is seen that there is no great difference between them, the additional milk, perhaps, being the principal feature. It is essential, of course, that these diets be varied and well cooked.

When varying the puddings, it must be remembered that they should always be made of highly nutritive food-stuffs. Fruit should be given at least three times a week in the form of stewed fruit, tarts, etc.; vegetables, also, are an important item in the diet; and a fair amount of potatoes and greens should be given at each meat meal; beans and peas and, to a less extent, carrots and parsnips, are also of great value.

The diet can be conveniently reduced in amount, when required, by reducing the amount of milk to 1 pint daily.

There are a very large number of people—what one may perhaps term the lower middle classes—who take a large midday meal and a meat tea followed by a light supper in place of the luncheon and dinner of the more well-to-do classes. Others, again, are in the habit of taking a fairly substantial sit-down tea (without meat) and also a substantial supper. To people who are accustomed to meals of this kind we can recommend the following diets.

Men.		Women.
	BREAKFAST.	
A soup-plateful.	Porridge (oatmeal, rolled oats, etc.), sugar and cream.	Four tablespoonfuls.
One pint.	Milk.	One pint.
$\frac{1}{2}$ oz. A piece the size of a walnut.	Butter.	$\frac{1}{2}$ oz. A piece the size of a walnut.
Three triangles of toast on a round and a half of bread	Bread or toast.	Two triangles of toast on a round of bread.
An ordinary helping.	Egg, bacon or sausage, etc.	An ordinary helping.

Men.		Women.
	DINNER.	
4 oz. (a large helping).	Meat (hot or cold).	3 oz. (a large plateful).
5 oz. (four the size of an egg).	Potatoes.	3 oz. (two the size of a hen's egg).
As desired.	<i>Green vegetables.</i>	As desired.
5 oz. (a large helping).	Milk or suet pudding.	4 oz. (a large helping).
1 pint.	Milk.	1 pint.
1½ oz. (half a round).	Bread.	1 oz. (half a round).
½ oz. (a piece the size of a walnut).	Butter.	½ oz. (a piece the size of a walnut).
	TEA.	
Three slices thin bread and butter.	Bread.	Two slices thin bread and butter.
	Butter.	
	<i>Jam, cake, cress, etc.</i>	
	SUPPER.	
3 oz. (a large helping).	Cold meat, boiled ham, tongue, fillets of fish, brawn, sausage, macaroni, cheese, etc., etc.	2½ oz. (a large helping).
5 oz. (a fair-sized helping).	Cold sweet such as cream, blanchmange, fruit and custard, trifle, etc.	4 oz. (a fair-sized helping).
1 pint.	Milk (possibly made into cocoa).	1 pint.
2 oz. (half a round, thick).	Bread or biscuit (with cheese if preferred).	1½ oz. (half a round).
½ oz. (piece the size of a walnut).	Butter.	½ oz. (a piece the size of a walnut).

The above dietary has the following nutritive value:—

Men . .	156 protein	168 fat	283 carbo-hydrate calorie value.
Women .	130 protein	145 fat	235 carbo-hydrate calorie value.

In the above table the essential articles are printed in Roman type, and the non-essentials in italics.

DIETS FOR THE WORKING CLASSES

When prescribing diets for the working classes, we have to bear in mind the following important points: (1) the diet, in its general lines of construction, must be similar to the meals which the poorer classes habitually take; for instance, it must contain considerably more carbohydrates than fat, roughly in the proportion of 5 parts of carbo-hydrate to 1 of fat. (2) The diet must be cheap, generally speaking, not costing more than one shilling a day.

TABLE SHOWING THE AVERAGE OF 100 EFFICIENT DIETARIES TAKEN BY WORKING-CLASS FAMILIES.

Food- Stuffs.	Amount.		Price (retail).	Cost in Pence.	Protein.	Fat.	Carbo- hydrate.
	Grammes.						
Milk .	$\frac{1}{2}$ pt.	280	@ $1\frac{1}{2}d.$ per pt.	0.75	10	11	14
Meat ¹ .	9 oz.	250	@ $7d.$ per lb.	3.93	38	48	—
Butter .	$\frac{2}{3}$ oz.	20	@ $1s.$ per lb.	0.50	—	16	—
Fish .	2 oz.	56	@ $4d.$ per lb.	0.50	5	1	—
Cheese .	$\frac{1}{2}$ oz.	14	@ $6d.$ per lb.	0.20	4	5	—
Egg .	one	one	@ 3 for $2d.$	0.66	6	4	—
Bacon .	2 oz.	56	@ $6d.$ per lb.	0.75	6	24	—
Total animal food				7.29	69	109	14
Bread ² .	14 oz.	400	@ $2\frac{1}{2}d.$ per 2 lb.	1.14	36	4	200
Flour .	1 oz.	28	@ $1s. 4d.$ per st.	0.08	3	—	21
Oatmeal	$\frac{1}{2}$ oz.	14	@ $2d.$ per lb.	0.07	2	1	10
Potatoes	9 oz.	250	@ $8d.$ per st.	0.32	4	—	52
Sugar .	3 oz.	85	@ $3\frac{1}{2}d.$ per lb.	0.70	—	—	85
Rice, etc.	$\frac{1}{3}$ oz.	10	@ $2\frac{1}{2}d.$ per lb.	0.03	—	—	6
Sundries, vegetables, etc. ³				0.43	6	—	20
				2.77	51	5	394
Beverages and unnecessary articles of low nutritive value				0.75	7	—	9
Totals				10.81	127	114	417

¹ Includes beef, mutton, pork, liver, sausage, etc.

² Includes cakes and buns.

³ Includes green vegetables, onions, tomatoes, currants, etc.; fruit, tea, coffee, condiments, etc.

Principles of construction of the average working-class diet.—The general lines of construction of dietaries taken by the working classes are well shown in the above table. This table represents an analysis which we have made of 100 efficient diets taken by working-class families. The average nutritive value of these 100 diets works out at protein 127 grammes, fat 114 grammes, and carbo-hydrate 417 grammes, giving a calorie value of 3,290, the average cost, excluding a small amount spent on beer, being 10*d.* a day.

As shown by the above analysis, the average working man takes some 33 per cent. of his protein in the shape of meat and fish (as compared with 60 per cent. taken by the leisured classes in the same food-stuffs), 20 per cent. in the form of dairy produce, 30 per cent. in the shape of bread, and 17 per cent. in other vegetable forms.

The average working man's diet is a distinctly bulky one owing to the large amount of carbo-hydrate it contains. It is perhaps worth mentioning that we once prescribed a thoroughly adequate dietary, such as we would give to the leisured classes, to some working-class patients, and they told us it did not satisfy their hunger. The very high nutritive value of the diet prescribed made it clear that it was perfectly adequate from a nutritive standpoint, and further observation showed us that it was lack of bulk wherein lay the fault. Apparently, in the case of many of the healthy working classes, a diet of considerable bulk, in addition to an adequate nutritive value, is necessary to satisfy hunger.

The exact construction of a diet for use by the working classes depends upon the amount of money available for food. In most working-class families when the bread winner has full work, from five to eight shillings are usually available for the purchase of food per week for each adult of the family. When a patient can afford a shilling a day

for his food his diet can be very closely modelled on the average diet shown in our analysis of diets taken by the working classes when in health.

The necessary increase of 30 grammes of protein can be conveniently given either as :—

(1) New milk, 2 pints ; this will cost 3*d.* or 4*d.* per day.

(2) Meat ; this will cost 3*d.* or 4*d.* per day according to the kind of meat used.

(3) Pulse food, 4 oz. ; this will cost $\frac{1}{2}$ *d.* per day.

(4) Pulse food, 3 oz. with $\left\{ \begin{array}{l} \frac{1}{2} \text{ pint new milk or} \\ \frac{1}{2} \text{ pint separated milk ;} \end{array} \right.$
this will cost 2*d.* per day, or less.

Of these various methods of increasing the protein, the giving of pulse and milk is perhaps the most economical and satisfactory, and the actual diet prescribed to the patient can thus be bought for a shilling a day.

The following diets, which have the requisite nutritive value and which can be bought for a shilling a day, we have found to be most satisfactory.

Men.		Women.
	BREAKFAST.	
Soup-plateful.	Porridge (sugar and milk).	Four tablespoonfuls.
1½ oz. (ordinary helping).	Bacon (cooked) or egg.	1½ oz. (an ordinary helping).
5 oz. for tea and porridge.	Milk.	5 oz. for tea and porridge).
3 oz. (a round).	Bread.	2 oz. (half a round, thick).
$\frac{1}{4}$ oz.	Butter.	
	DINNER.	
5 oz. (= 9 oz. as purchased) (a large plateful).	Meat (cooked).	4 oz. (a large helping).
5 oz. (four the size of an egg).	Potatoes.	3 oz. (two the size of an egg).
5 oz. (a large helping).	Green vegetables.	A large helping.
$\frac{1}{2}$ pint.	Suet pudding.	$\frac{1}{2}$ pint.
	Milk.	

Men.		Women.
	TEA.	
6 oz. (two thick rounds).	Bread, cake, etc.	4 oz. (a round and a quarter).
1 or 2 oz. (a table-spoonful).	Jam.	1 or 2 oz.
$\frac{1}{2}$ oz. (a piece the size of a walnut).	Butter.	$\frac{1}{2}$ oz. (a piece the size of a walnut).
	SUPPER.	
Soup-plateful. 2 oz.	Pulse soup, or Sausage, ham or cold meat.	Soup-plateful. 2 oz.
Soup-plateful. 5 oz.	Or oatmeal porridge and milk and cheese, 2 oz.	Soup-plateful. 4 oz.
2 oz. (half a round).	Milk or light pudding.	2 oz. (half a round).
$\frac{1}{4}$ oz.	Bread.	$\frac{1}{4}$ oz.
	Butter.	

These diets have the following approximate nutritive values.

Men . . .	P. 156	F. 120	C.H. 468	Cals. 3,674
Women . . .	P. 130	F. 100	C.H. 380	Cals. 3,021

The cost of the above diets works out at about 1s. 1d. a day for men, and a little less for women.

Cheaper diets for the working classes.—When the amount of money available for the purchase of food is below 7s. per week, cheaper diets than those just described must be given, it being absolutely essential that a diet prescribed for a patient should be compatible with his means.

Our standard working-class diet can be reduced in cost in various ways without impairing its nutritive value, viz. :—

- (1) By reducing the amount of whole milk, and replacing it either in part or entirely by separated milk.
- (2) By using the cheaper forms of meat.
- (3) By increasing the amount of bread or pulses.
- (4) By the substitution of margarine for butter.

In the following table we give, in parallel column, details of four dietaries, all of which are adequate in nutritive value, for the efficient treatment of tuberculosis, and the cost of which varies from 4s. 6d. to 7s. per week.

The palatability and variety of these diets vary directly with their cost; and cheapest of these diets, costing 7·7d. per day, can be made quite sufficiently palatable with a little care. It is scarcely possible to prescribe a really adequate diet which will cost less than 4s. 6d. per week; to be efficient, such a diet would have to contain a very large amount of vegetable protein, viz., pulses, etc., and to make such a diet palatable requires very careful, almost skilled, cooking.

Diet 1 on our table we know by experience to be in every way satisfactory. The amount allowed for the purchase of the several items of food allows of a considerable variation being made from time to time in the diet. Thus, purchasing meat at an average price of 7d. per pound allows of the inclusion of every joint of foreign beef at 7½d. per pound, Canterbury lamb or mutton at 7d. per pound, meat for meat puddings at 4d. or 5d. per pound, and of liver, kidney, sausage, etc. Findon haddock, cod, etc., and especially tinned salmon, to which the working classes are particularly partial, may also be included in the list of food-stuffs from which selection can be made. The composition of this diet also allows for a suet or milk pudding every day. It will be noticed that a pint of milk and an ounce of butter are also included.

The prices of the various food-stuffs from which the total cost of this diet (11·74d. per day) has been calculated are those at which we have actually bought the various articles at ordinary shops and in retail amounts.

In Diet 2, which costs 10·18d. per day, economy has been effected by giving only half a pint of whole milk and replac-

TABLE SHOWING THE COMPOSITION OF DIETS SUITABLE FOR THE TREATMENT OF CONSUMPTION,
AT A COST OF 4s. 6d., 5s. 4d., 6s., AND 7s. RESPECTIVELY.

Composition.	1		2		3		4	
	Oz.	Price.	Oz.	Price.	Oz.	Price.	Oz.	Price.
Whole milk	20	@ 2d. per pt.	10	@ 2d. per pt.	—	—	—	—
Separated milk	—	—	10	@ 1d. per pt.	20	@ 1d. per pt.	5	@ 1d. per pt.
Meat, etc. (as purchased)	—	@ 7d. per lb.	9	@ 6d. per lb.	9	@ 5d. per lb.	6	—
Butter	1	@ 1s. per lb.	—	—	—	—	—	—
Margarine	—	—	1	@ 8d. per lb.	1	@ 8d. per lb.	1	@ 6d. per lb.
Suet	$\frac{1}{2}$	—	$\frac{1}{2}$	—	$\frac{1}{2}$	—	—	—
Cheese	2	(American) @ 7d.	2	(Dutch) @ 5d.	2	(Dutch) @ 5d.	3	(Dutch) @ 5d.
Bacon and brawn	2	@ 6d. per lb.	2	@ 6d. per lb.	2	@ 6d. per lb.	2	@ 6d. per lb.
Bread	12	—	12	—	12	—	16	—
Potatoes	8	—	8	—	8	—	8	—
Pulses	3	—	3	—	3	—	4	—
Oatmeal	2	—	2	—	2	—	2	—
Sugar	2	—	2	—	2	—	2	—
Jam	1	—	1	—	1	—	1	—
Rice, etc.	$\frac{1}{2}$	—	$\frac{1}{2}$	—	$\frac{1}{2}$	—	—	—
Flour	1	—	1	—	1	—	—	—
Green vegetables	Sufficient amounts	—	Sufficient amounts	—	Sufficient amounts	—	Sufficient amounts	—
Sundries	—	—	—	—	—	—	—	—
Protein (grammes)	—	156	—	158	—	158	—	151
Fat (grammes)	—	141	—	121	—	110	—	94
Carbo-hydrate	—	432	—	432	—	432	—	459
Calories	—	3,722	—	3,545	—	3,452	—	3,375
No. of grammes of Protein bought per penny spent	—	13.3	—	15.5	—	17.3	—	19.5
No. of calories do.	—	318	—	348	—	374	—	437
Ratio of costs of animal and vegetable foods	—	72.5 : 27.5	—	68.3 : 31.7	—	64.6 : 35.4	—	54.7 : 45.3
Cost per diem	—	11.74d.	—	10.18d.	—	9.12d.	—	7.72d.
Cost per week	—	7s.	—	6s.	—	5s. 4d.	—	4s. 6d.

ing the other half-pint by separated milk. The ounce of butter at 1s. per pound is replaced by 1 oz. of margarine at 8d. per pound, and 6d. per pound is allowed for meat instead of 7d. This means that, for the most part, the cheaper forms of meat will have to be bought.

In Diet 3, which costs 9·12d. per day, no whole milk is included, a pint of separated milk being used instead, and only 5d. per pound is allowed for meat.

Still further economy, as shown by the fourth diet at a

	Amount.		Price Retail.	Nutritive Value.			Cost.
	Oz.	Grms.		Protein.	Fat.	Car-Hyd.	
Separated milk .	20	570	@ 8d. per gal.	19	1	28	1·00
Meat, etc. . . .	6	170	@ 5d. per lb.	31	20	—	1·88
Margarine . . .	1	30	@ 6d. per lb.	—	22	—	0·38
Suet	—	—	—	—	—	—	—
Cheese (Dutch). .	2	56	@ 5d. per lb.	18	11	—	0·63
Egg	—	—	—	—	—	—	—
Bacon	2	56	@ 6d. per lb.	4	24	—	0·75
Total animal food				72	78	28	4·64
Bread	16	460	@ 2½d. per 2 lb.	41	5	230	1·25
Potatoes	8	230	@ 8d. per st.	2	—	32	0·28
Pulses	4	112	@ 2d. per lb.	27	2	71	0·50
Oatmeal	2	56	@ 2d. per lb.	8	4	37	0·25
Sugar	2	56	@ 2½d. per lb.	—	—	56	0·31
Jam	1	28	@ 3½d. per lb.	1	—	16	0·22
Rice, etc.	½	14	@ 2½d. per lb.	—	—	10	0·08
Flour	—	—	—	—	—	—	—
Green vegetables	—	—	—	5	—	10	0·20
Sundries	—	—	—	—	—	—	0·50
Total vegetable food				84	11	462	3·59
Total food				156	89	490	8·23

Calories bought per penny, 409.

No. of grammes of protein bought per penny, 18·9.

Total calorie value, 3,476.

Ratio of cost of animal to vegetable food, 56·3 : 43·7.

cost of 7·7*d.* per day, is obtained by reducing the amount of separated milk to 5 oz. per day, and the amount of meat to 6 oz. per day. As compensation, the daily amount of cheese is increased by 1 oz., the amount of bread by 4 oz., and the amount of pulses by 1 oz. Such a dietary as this will only be necessary when dealing with the very poor.

The above dietary, which costs just over 8*d.* per day, will also be found adequate for the treatment of tuberculosis.

Diets for use in sanatoria for the working classes, where the patients are employed in various forms of manual labour.—In sanatoria, where the convalescent patients are employed in actual manual work, a diet of higher calorie value must be given. After considerable experience, we have adopted the following dietary as our standard for the treatment of this class of patient.

Breakfast.—Tea.

Porridge, $\frac{1}{2}$ pt. (= oatmeal, 2 oz.).

Bacon (cooked), $1\frac{1}{2}$ oz.

Milk for tea and porridge, 5 oz.

Loaf sugar, $\frac{3}{4}$ oz.

Moist sugar for porridge, $1\frac{1}{2}$ oz.

Bread, 3 oz.

Butter, $\frac{1}{4}$ oz.

Dinner.—Roast joint, etc., 5 oz. = 9 oz. as purchased.

Potatoes, 5 oz. = 8 oz. as purchased.

Suet pudding, 5 oz.

Green vegetables, q.s.

Tea.—Tea.

Bread, 8 oz. (three rounds).

Butter, $\frac{1}{2}$ oz.

Jam, lettuce, etc., q.s.

Supper.—Pulse soup, $\frac{1}{2}$ pt. (= 3 oz. dry pulse).

Or bread, 3 oz. and cheese, 2 oz.

Or sausage, liver, fish, ham, etc.

Milk or cornflour pudding, fruit, etc., 8 oz.

Cocoa or milk, $\frac{1}{2}$ pint.

Milk may be added if thought desirable in any individual case, but if the whole of the above diet can be taken, milk will be unnecessary.

The protein value of this diet works out at 150 grammes, and the total calorie value at about 4,000.

The use of whole milk and butter, rather than of margarine and separated milk which would make the diet appreciably cheaper, is advised; joints of meat are also given daily. An important feature in this diet is that the extra amount of nourishment required, especially the increase of protein, is given in the cheap form of vegetable protein. This vegetable protein, however, is given in comparatively small amounts and in a palatable form.

The diet, as a whole, is a palatable one, and readily taken by the working classes. From a clinical standpoint, also, we have found it most satisfactory. Its economic efficiency is well shown by the fact that it costs only 6s. 8d. a week, and for every penny spent 13·2 grammes of protein and 336 calories are bought. This diet should be reduced 15 per cent. in its value when prescribed to women patients.

The following is a good weekly menu which can be given when using the diet just described.

WEEK'S MENU.

	Breakfast.	Dinner.	Tea.	Supper.
<i>Sunday</i> .	Porridge and milk, cold ham, tea, bread and butter.	Roast beef, baked potatoes, boiled peas, fruit tart.	Tea, bread, butter, cake.	Tinned salmon, sponge cake and custard, bread and cheese.
<i>Monday</i> .	Porridge and milk, fried bacon (rest as above).	Boiled mutton, potatoes and greens, date pudding.	Tea, etc., jam.	Bean soup, macaroni pudding.
<i>Tuesday</i> .	Porridge and milk, fried bacon.	Cottage pie, suet roll and jam.	Tea, etc., cake.	Fried liver, blanc-mange, stewed fruit.

WEEK'S MENU—*continued.*

	Breakfast.	Dinner.	Tea.	Supper.
<i>Wednesday</i>	Porridge and milk, fried bacon.	Stewed steak and onions, potatoes, boiled gingerpudding.	Tea, etc., lettuce.	Pea soup, boiled rice and jam.
<i>Thursday</i>	Porridge and milk, cold ham.	Roast mutton, boiled beans, bread pudding.	Tea, bread, butter, and jam.	Sausage or fish, bread and butter pudding.
<i>Friday</i>	Porridge and milk, bacon.	Boiled beef and vegetables, potatoes, plum duff.	Tea and cake.	Lentil soup, baked lemon pudding.
<i>Saturday</i>	Porridge and milk, Fintondock.	Beef steak and kidney pie, boiled peas, milk pudding.	Tea, etc., jam.	Stewed kidney and macaroni, blanchmange, stewed fruit.

Directions for poor tubercular patients living at home, for instance, those attending out patients' departments at hospitals, etc.—It is by no means easy efficiently to direct the dietetic treatment of tubercular people belonging to the working classes unless they are immediately under supervision, e.g. in an institution. In our experience, the prescription of a definite diet to consumptive patients among the poorer classes is not satisfactory, as, for the most part, they have not the means at home of carrying out instructions at all accurately.

We have obtained more satisfactory results in such cases after giving general directions, as under :—

“ You require to take much more food than you did before you became consumptive. Do not hurry over your meals ; you will feel satisfied frequently before you have

eaten enough, and you must continue to eat even when you do not want more food. Your appetite is no guide as to the amount you need. The best way to find out whether you are eating enough is to weigh yourself every week, always at the same time of day and in the same clothes. If you have not gained at least one pound during the week, you will know you have not been eating enough.

“What food to buy and how to cook it.—The following is intended to give you a rough idea as to how you can arrange your meals most satisfactorily, and the amounts of the various foods you require.

“Breakfast.—Half a pint of porridge with milk and sugar, a rasher of bacon or a herring, etc., a round of bread. Tea or coffee.

“Dinner.—Two large chops or a large plateful of meat, with plenty of potatoes. A teacupful of milk pudding, or a large slice of suet pudding, half a round of bread, and a glass of milk.

“Tea.—At least three rounds of bread and butter with jam, or, if you can afford it, other relish.

“Supper.—Half a pint of pea, bean, or lentil soup, or half a pint of porridge; two rounds of bread, with sufficient cheese for both pieces; and a glass of milk.

“If you take this diet, you ought to gain at least a pound a week in weight, but if you do not, your best course is to take more milk until your weight increases.

“The above diet should cost you about 6s. 6d. per week, but you will require to be careful as to what you buy, and the following notes will probably be of service to you in showing you how to spend your money to the greatest advantage.

“Meat.—If you cannot afford to buy English meat, buy the best foreign, which contains just as much nourishment, and will not cost you more than 6½d. per pound for the best joints. If you cannot afford to buy joints you must be content to buy ‘pieces.’ Make full use of tripe, sausage,

bullock's liver and kidney, which are cheap and nutritious, but do not waste money on veal and lamb.

“*Butter.*—Buy butter at 1s. a pound if you can afford it, but if money is scarce buy good margarine instead, at 6d. or 8d.

“*Milk.*—You can always get new milk at 1½d. or 2d. per pint, but if you cannot afford to buy much new milk, buy what you can afford and make up with separated milk, which will cost you 1d. or 1½d. per quart.

“*Cheese.*—Dutch cheese will cost you 4½d. to 6½d., and American 6d. or 7d. Do not buy more expensive cheese, as you will get no more nourishment for the extra cost.

“*Eggs.*—Except during the early summer, eggs are always an expensive form of food, therefore do not spend more on them than you can help.

“*Oatmeal.*—Oatmeal is one of the very best and cheapest foods you can have. Buy coarse Scotch oatmeal, Provost or Quaker oats, and have a plateful of porridge every morning and, if you like it, occasionally at supper instead of the soup.

“*Dried peas, beans, and lentils.*—These, like oatmeal, are most valuable foods for you, and should be used every day either boiled as a vegetable for dinner or as a soup for supper. You can buy them at the grocer's; the peas and haricot beans will cost you 2½d. per pound or pint, and the lentils 2d.

“*Potatoes.*—These are required every day, and you will save money if you buy at least a stone at a time.

“*Fish.*—Buy fish instead of meat occasionally for the sake of a change, either cod, plaice, herrings, bloaters, Findon or fresh haddocks, or whatever fish is in season and cheap. Tinned salmon at 5d. a tin is a cheap and nutritious food, and makes a good change for supper.

“ The following rough directions for cooking may be of use :—

“ *Porridge*.—Stir oatmeal gradually into boiling water, add a pinch of salt, and cook gently, stirring occasionally for an hour (Quaker and Provost oats take only 20 minutes to cook). Allow two teacupsful of water and two level tablespoonsful of oatmeal to each man.

“ *Lentil, pea or bean soup*.—Soak the seeds in cold water over night. Boil gently in plenty of water until soft ; the cooked seeds may either be eaten as a vegetable, or they may be beaten to a fine paste, or, better still, rubbed through a sieve ; add a little of the liquid in which they were boiled, and a flavouring if required, to form a highly nutritious soup. Allow three level tablespoonsful of the raw seeds for each man.

“ *Suet puddings*.—(1) Allow one level teaspoonful of dripping, three level tablespoonsful of flour, and a large pinch of baking powder per man. Mix the dripping thoroughly with the flour and baking powder. Make the whole into a paste with a little water, form into a roll, flour the surface, tie up tightly in a pudding cloth, and boil for 2 or 3 hours. Serve with syrup, gravy, or jam.

“ (2) Or the above paste may be rolled out flat, and jam or syrup spread upon it. Roll, fold in the ends, flour the surface, tie tightly in a cloth, and boil for 2 or 3 hours.

“ (3) Allow one level teaspoonful of dripping, three level tablespoonsful of flour, a large pinch of baking powder, and a little sugar and fruit for each man. The fruit may be either currants, figs, or dates chopped up finely, or raisins. Mix the flour and dripping and sugar, add the fruit and make into a paste with a little water, flour the surface, and tie tightly in a cloth ; boil 2 or 3 hours. Instead of the fruit, a little syrup and a pinch of ground ginger may be used in the above mixture.

“*Milk pudding*.—Allow for each person two level teaspoonsful of rice, sago, tapioca, etc., and two-thirds of a pint of milk and a small teaspoonful of sugar. Put the rice, sugar and milk, with a pinch of salt, into a pie-dish, and bake slowly in the oven for 2 or 3 hours.”

The above directions have stood the test of experience; they have been given to patients and used by them, the results being carefully tested. The improvement in the state of the lungs and general health, gain in weight, etc., prove them (in most cases we have followed) to be most satisfactory.

CONCENTRATED DIETS

The maintenance of a high level of nutrition is of essential importance for the efficient treatment of tuberculosis and inability on the part of a patient suffering from this disease to take a fairly generous diet, such as one of our standard dietaries, materially prejudices his chances of recovery. Anorexia is a very common symptom in tubercular patients. In some cases it is of small importance and requires no special treatment. Not infrequently, on the other hand, it requires the most careful dieting.

Anorexia of a very marked character is often met with in patients suffering from early tuberculosis; this anorexia has usually been of gradual onset and associated with progressive loss of strength and weight. The patient is anæmic and obviously run down, and on inquiry is found to be taking a diet altogether inadequate for a person in ordinary health, much less for a person suffering from tuberculosis.

Consumptives suffering from the earlier stages of the disease, especially those living under unfavourable hygienic conditions (for instance a clerk working in a badly venti-

lated city office), very commonly have this anorexia of early tuberculosis. A certain amount of dyspepsia is sometimes associated with loss of appetite, but examination of the alimentary track shows that the digestive organs are perfectly normal.

The treatment of this type of anorexia consists in placing the patient under good hygienic conditions and giving him a generous diet which he should be strongly encouraged to take, in spite of the absence of appetite. There are few things more striking than the immediate improvement in appetite which follows the removal of a patient suffering from early pulmonary tuberculosis from unfavourable conditions to a sanatorium. If the patient takes the generous diet, as advised, it is seldom that this course of treatment is not completely successful.

Within a week of his arrival the patient usually has entirely regained his normal appetite, and indeed, if urged to do so, will eat enormously, an experience which many a sanatorium patient has unfortunately suffered from.

A much more serious type of anorexia is that very often met with in patients suffering from active tuberculosis associated with pronounced constitutional disturbance, such as high fever, etc. A patient with a considerable amount of fever, whatever be its cause, rarely retains a normal appetite. In a large number of febrile diseases, especially in those running a short course, comparatively speaking, the normal diet of health can be appreciably reduced without disadvantage to the patient. In the case of tuberculosis this cannot be done; at all costs, the patient's diet must be kept up to a high standard of nutritive value. The same principle holds good for another type of anorexia, commonly met with in tubercular patients, viz., the chronic loss of appetite associated with slowly progressive disease of long duration. Patients

who suffer from long-standing progressive tuberculosis usually have their constitutions permanently damaged; vascular and muscular tone are poor, and the alimentary track is generally impaired. This impairment, in our experience, is very largely atonic in character, the most pronounced symptoms being persistent loss of appetite, fulness and abdominal discomfort after meals with nausea and vomiting if large meals are taken. We have been interested to observe that stomach analyses and metabolic investigations in these cases show that digestion and absorption are almost invariably normal.

The dietetic treatment of the anorexia of acute constitutional disturbance, and of the digestive impairment of disease of long standing are very similar. In the case of patients with acute symptoms, such as high fever, etc., it is a good practice to encourage the patient to make an effort to take an ordinary diet, such as one of our standard diets, and to remind him that his illness is likely to be a protracted one and that he must take a good supply of food daily if he wishes to get better.

We have found that many patients with high fever, especially those in whom the infection is of a recent date, and in whom the constitution has not been impaired, take an ordinary diet quite well and with most satisfactory clinical results. Our experience inclines us to think that the patients who manage to take an ordinary diet, for the most part, make more rapid progress. An ordinary diet, however, should not be continued if it gives rise to much dyspepsia, or if the patient, after some ten days' trial of it, takes an inordinate time over his meals. In a similar way, patients suffering from long-standing chronic disease and who have marked anorexia and dyspepsia, can sometimes be persuaded to take an ordinary diet and do remarkably well; general health improves, and with this improve-

ment the dyspepsia gradually disappears and appetite returns. Such a happy result is most likely to follow this treatment in the case of such patients who have just given up work and exchanged life in a town for the favourable conditions afforded by residence in a sanatorium. To prescribe generous diets to the same class of patients who are still at work in a city, or who have already enjoyed the advantages of a sanatorium for some time, is much less likely to prove a success. Considerable judgment must be exercised in determining how long to urge the taking of ordinary diets despite the existence of loss of appetite and dyspepsia, both in the case of patients with acute and chronic disease; gradually increasing anorexia and dyspepsia, and especially onset of nausea and vomiting, however, certainly indicate that the diet should be modified by way of concentrating it.

In constructing what we term, for convenience, concentrated diets, we aim at two things.

(1) To give the necessary nutritive value in an appreciably smaller bulk than that of our ordinary diets.

(2) To give the diet generally in a more easily taken form, for which purpose the amount of solid food is diminished.

Method of concentration.—The first thing to do is to diminish, or even to eliminate, the amount of food-stuffs which have little or no nutritive value, for instance, soups, potatoes, green vegetables, also the amounts of those food-stuffs which are somewhat bulky, for instance, porridge, pulses, bread and suet puddings. The nutritive value of the food-stuffs thus eliminated must be replaced by the inclusion of other food-stuffs which give the same nutritive value in a smaller bulk. To keep up the protein intake to the requisite standard, the milk should be “fortified,” i.e. its nutritive value should be increased by the addition to it of a soluble casein preparation such as casumen, plas-

mon and similar food-stuffs. This is easily done. It is also a very good thing to fortify milk puddings and soups in the same way.

We find that as much as an ounce and a half of such a casein preparation, which represents some 32 grammes of protein, may be taken daily without giving rise to the slightest disturbance of the alimentary tract. The advantage of being able to increase the protein value of a diet by 30 grammes with so little trouble is obvious.

Milk is altered in taste by the addition to it of a casein preparation so that patients usually prefer to take this food-stuff disguised in puddings, etc. Bread and biscuits fortified in the same way are also very useful, and can be bought ready prepared, for instance, as plasmon bread and plasmon biscuits.

Another good method of keeping up the protein intake is by increasing the eggs in the diet, as egg-flip, for example, which can replace some of the plain milk. Protein also can be taken by some patients very well as raw meat given either in sandwiches or in milk.

The calorie value of the diet can be conveniently maintained at the requisite level by the use of various food-stuffs. Cream, for instance, is very useful, and 5 oz. of cream can be readily given partly in the milk and partly with the puddings. Benger's food and similar starchy food preparations are also very useful.

Dislike of sugar.—A practical point to bear in mind is that patients with anorexia are mostly intolerant of sweet foods, and it is a good practice to reduce the amount of sugar contained in their food-stuffs by one-half. More or less unsweetened puddings will be well taken by febrile patients much longer than sweet puddings.

Variety.—Variety is always essential when diets of considerable nutritive value have to be taken for a very long

period. Plenty of variety is especially important in the dietetic treatment of patients with fever. Free use should be made of all the ordinary roast joints and meats, of poultry, game, etc., varied by made up dishes such as mince, hashes, stews, etc.; sweetbreads and sausages also make a change. Puddings may be readily varied, so long as their ingredients are of a high nutritive value, such as egg, milk, cereals, bread, flour, etc. Blancmanges, cream, gelatine, junket, custards, etc., are very useful puddings with which to vary the diet.

It is perhaps not out of place for us to say that the controlling of fever by the use of sponging or various antipyretic drugs, is often a very great aid in the dieting of patients with febrile anorexia. The reduction of temperature by some such methods in the course of the hour before meals often sufficiently improves the condition of the patient, if only temporarily, to allow of his taking his food with much less difficulty. The prescription, also, of an ordinary bitter tonic half an hour before meals is often of considerable service in all types of anorexia.

The following two dietaries which are examples of the concentrated diets we are in the habit of prescribing will be found very useful.

The first, which is our ordinary standard diet fortified and somewhat concentrated, is suitable for patients with a moderate degree of anorexia. The second is a more or less fluid diet and is suitable for patients with continuous high fever.

These two diets are illustrative and show the principles upon which concentrated diets should be constructed; to be thoroughly satisfactory they should be constantly varied, as patients with anorexia very soon tire of any food if continuously given in the same form.

ANOREXIA DIET 1.

	Men.	Women.
Breakfast—		
Milk	1 pt.	1 pt.
Tea or Coffee (chiefly for flavouring milk) . . .	Small quantity	Small quantity
Bacon, etc.	1½ oz.	1½ oz.
Egg		
Bread or toast	2 oz.	1½ oz.
Butter	½ oz.	½ oz.
11 a.m.—		
Milk and casein . . .	½ pt.	½ pt.
Lunch—		
Milk	½ pt.	½ pt.
Fish or entrée	2 oz.	2 oz.
Meat, fowl or game . .	2 oz.	2 oz.
Potatoes, etc.	Small amount	Small amount
Bread or toast	2 oz.	1½ oz.
Butter	½ oz.	½ oz.
Milk pudding, stewed fruit and custard junkets, creams, etc. (perhaps con- taining casein) . . .	Ordinary helping	Ordinary helping
4 p.m.—		
Tea, bread and butter, etc.	Small quantity if desired	Small quantity if desired
Dinner—		
Milk	½ pt.	½ pt.
Fish	2 oz.	2 oz.
Entrée, fowl, game, etc. .	2-3 oz.	2-3 oz.
Bread or toast	2 oz.	1½ oz.
Butter	½ oz.	½ oz.
Light pudding, jellies, fruit, custard, etc. (perhaps containing casein) . . .	Ordinary helping	Ordinary helping
Dessert	q.s.	q.s.
Bedtime—		
Milk and egg	½ pt.	½ pt.

ANOREXIA DIET 2.

For Men or Women.

8 a.m. (on waking) . Milk, ½ pt.

9 a.m.	Breakfast	Milk (with casein) made into tea or coffee, $\frac{1}{2}$ pt. Boiled bread and milk, $\frac{1}{2}$ pt. 1 egg poached or scrambled on small piece of buttered toast.
11 a.m.	.	Benger's food with casein, $\frac{1}{2}$ pt.
1 p.m.	.	Milk, $\frac{1}{2}$ pt. Toast (or rusks) and butter, $\frac{1}{2}$ oz. Pounded chicken, etc. Steamed fish or raw meat sandwiches } 2 or 3 oz. Thin custard, $\frac{1}{2}$ pt.
4 p.m.	.	Tea made with milk, $\frac{1}{2}$ pt.
6 p.m.	.	Milk, $\frac{1}{2}$ pt. Fish or pounded chicken, etc., 2 or 3 oz. Toast (or rusks) and butter, $\frac{1}{2}$ oz. Junket, light pudding, etc., 5 oz.
9 p.m.	.	Benger's food with casein, $\frac{1}{2}$ pt.
During night	.	Milk and egg (with or without alcohol), $\frac{1}{2}$ pt.

$1\frac{1}{2}$ oz. of casein should be worked into the diet daily and 5 oz. of cream added to the day's supply of milk. The nutritive value of this dietary is P. 175, F. 160, C.H. 200, Cals. 3,025.

If the anorexia is very persistent and severe it is often advisable to give the diet more often and in smaller amounts ; sometimes, also, especially in the case of those who are very acutely ill, it is good practice to give some of the food during the night. The following is an example of a fluid diet given in small amounts fairly frequently. This diet which we have found in practice to be readily taken by patients who are very ill has a high nutritive value, viz., protein, 160 ; fat, 165 ; carbo-hydrate, 213 ; and calories, 3,063.

FLUID DIET.

8 a.m.	.	Milk, $\frac{1}{2}$ pt.
9 a.m.	.	Milk with casein (coffee for flavour), $\frac{1}{2}$ pt. Bread and milk, $\frac{1}{2}$ pt.
11 a.m.	.	Benger with casein, $\frac{1}{2}$ pt.
1 p.m.	.	Milk with casein. Bovril, $\frac{1}{2}$ pt. or Raw meat, milk.

or

Raw meat sandwiches, 2 oz.

3 p.m. Egg and milk or thin custard, $\frac{1}{2}$ pt.5 p.m. Milk tea, $\frac{1}{2}$ pt.7 p.m. Leube Rosenthal meat solution, $\frac{1}{4}$ tin.*or*Raw meat, milk, $\frac{1}{2}$ pt.*or*Milk bovril, $\frac{1}{2}$ pt.*or*Milk and arrowroot pancreatized, $\frac{1}{2}$ pt.10 p.m. Bengel with casein, $\frac{1}{2}$ pt.4 a.m. Milk and egg (with or without alcohol),
 $\frac{1}{2}$ pt.

THE DIETETIC TREATMENT IN TUBERCULOSIS OF VARIOUS ORGANS

Laryngeal tuberculosis with dysphagia.—The general principles which we have laid down for the dieting of tuberculosis generally apply to tuberculosis of the larynx. In disease of this organ, which is nearly always co-existent with tuberculosis of the lung, there is the same necessity for maintaining a high level of nutrition. The treatment of patients with laryngeal tuberculosis who have no difficulty in swallowing requires no special notice, but the existence of dysphagia calls for very special treatment. In many cases the dysphagia is of quite slight degree and far from being severe enough to prevent the patient taking an ordinary diet. In general terms it may be said that when a patient can take an ordinary diet without appreciable inconvenience, he should be advised to do so, as the taking of a generous diet is thus rendered much easier and will often bring about rapid improvement in the laryngeal condition with loss of the pain on swallowing. In the case of such patients, however, it is a good plan to inquire whether there is any particular food-stuff which causes pain, and if there is to omit the same from the diet. When the dys-

phagia is severe enough to prevent the patient taking an adequate diet in an ordinary form semi-solids or fluid diets must be relied upon until such time as improvement in the general condition and the condition of the larynx makes it possible to return again to ordinary diet.

When semi-solids and fluid diets are prescribed, considerable care must be exercised in the arrangement of the meals to ensure a sufficient amount of nutriment being taken. As a matter of experience, we have found that semi-solid diets are often taken more readily than fluid diets, the latter having more tendency to "go down the wrong way." This tendency can, however, be considerably lessened by the patient taking a fluid diet in the Norris-Wolfenden position. Another advantage of the semi-solid diet is that a high nutritive value can be given in this form in a good deal smaller bulk than in a fluid diet. The bulkiness of a fluid diet is very apt to give rise to dyspepsia.

Constant slight variations should be made in the diet whether fluids or semi-fluids are used, as patients soon tire of either of them. In practice, it is usually best to compromise between a semi-solid and a fluid diet or to alternate them. In no form of tubercular disease is there the same necessity for the constant close attention to dietetic detail as exists in these cases of laryngeal tuberculosis, and the secret of success in treating such cases lies in making a close study of every individual case, carefully seeing what solid foods, if any, can be taken, building up the necessary diet round these food-stuffs, allowing the patient at the same time to indicate his own preferences and then varying the diet judiciously day by day. All food-stuffs should be given cold and very often if the fluids are iced they are taken more easily. Anything of an irritating nature, such as pepper and similar condiments, should be omitted.

When the pain in swallowing is very severe it may be necessary to give food in small amounts every four, or three, or even two hours during the day. At all costs the taking of an adequate diet must be secured. There are several measures at our command which are often of the greatest assistance to these patients. The insufflation of the larynx with orthoform or anesthesin between meals will often allay pain sufficiently to allow of food being taken much more readily. The application, also, of cold to the larynx—preferably by the use of a Leiter's laryngeal coil is often of distinct service in this respect. Again, taking the food when in the Norris-Wolfenden position, i.e. when lying on the side, the food, if liquid, being taken through a tube from a vessel placed slightly below the level of the mouth, or in the Wolfenden position, viz., the patient lying on his chest with the head somewhat dependent and taking the food in the same way, may help considerably.

In the construction of diets for patients with dysphagia many of the concentrated foods which we have described in the article on the treatment of anorexia, etc., will be found very useful. Full use should be made of all the various foods from time to time, so as to get plenty of variety. The following examples of diets which we have used with satisfactory results may perhaps be of value as showing how they should be constructed.

FLUID DIET SUITABLE FOR PATIENTS WITH DYSPHAGIA.

8 a.m.		Thin Benger's food, 1 pt.
10 a.m.		Egg, 1; milk, 5 oz.
11 a.m.		Milk and sanatogen, or soluble casein preparation, 1 pt.
1 p.m.		Milk cocoa, 1 pt.
3 p.m.		Junket, 1 pt.
5 p.m.		Thin Benger's food, 1 pt.
7 p.m.		Milk bovril, 1 pt.
9 p.m.		Egg, 1; milk, 5 oz.

10 p.m. . . . Thin Benger's food, 1 pt.
 During night . . . Milk and sanatogen, etc., 1 pt.

Total—Benger's food, 3 pts.

Milk and sanatogen, etc., 2 pts.

Milk in other forms, $3\frac{1}{2}$ pts.

Eggs, 2.

Approximate nutritive value: Protein, 180; Fat, 210; Carbohydrate, 280; Calorie value, 3,940.

Dysphagia patients constantly fail to take the prescribed diet well at some time every day. As the nutritive value of the above diet is very considerable a certain amount of latitude may be allowed in this respect, and at the same time the patient should be encouraged to persevere with the full diet.

The fluid diet mentioned in discussing the treatment of anorexia, etc., is also frequently suitable.

SEMI-SOLID DIET SUITABLE FOR PATIENTS WITH DYSPHAGIA.

7 a.m. . . . Egg and milk, 1 pt.
 9 a.m. . . . Arrowroot or cornflour milk, or typhoid
 bread and milk, 1 pt.
 11 a.m. . . . Gelatin blancmange or cream (flavoured).
 1 p.m. . . . Steamed fillets of fish, or 4 eggs scrambled
 with 1 oz. butter.
 3 p.m. . . . Junket and cream, 1 pt.
 5 p.m. . . . Milk and raw meat juice, 1 pt.
 7 p.m. . . . Velvet soup, 1 pt.
 During night. . . Benger's food or milk, cocoa, etc., 1 pt.

Approximate nutritive value: Protein, 164; Fat, 210; Carbohydrate, 220; Cals., 3,013.

Hæmoptysis.—It is very difficult to dissociate the dietetic treatment of hæmoptysis from the general treatment of this complication. The dietetic treatment of hæmoptysis varies very considerably with the cause and severity of the bleeding and the condition of the patient.

It must be remembered that hæmoptysis may be anything between slight discoloration of the sputum to a loss

of blood amounting to several pints. Slight discoloration of the sputum is by no means uncommon among consumptives and is probably the result of some local congestion. Such cases rapidly clear up if kept at rest for a day or two and usually require no special dietetic treatment. If, however, the discoloration continues or if the bleeding is from the commencement rather more marked, it is desirable to restrict the diet somewhat particularly in the amount of fluid taken, in order to reduce blood pressure to some extent. This is easily accomplished by cutting off all tea, coffee, etc., reducing the amount of milk taken to 1 pint a day, and for a day or two reducing the amount of solid food taken to a slight extent.

In the case of severe hæmoptysis, due probably to the erosion of a blood vessel or the rupture of a pulmonary aneurism, the indication is to reduce blood pressure as quickly as possible and to maintain it at a low level for some days after all bleeding has ceased. For this purpose the diet should be small in bulk and should contain but very little fluid. For the first 24 hours after a severe hæmorrhage little or no food should be given, milk in small amount, 1 or 2 teaspoonfuls at a time, being allowed to allay thirst more than for any other purpose. Milk should be iced and the mouth should be washed out at intervals with iced water, or small lumps of ice may be given to suck. Such patients suffer a great deal from thirst, especially if they are treated by free purgation with salts; ice relieves the thirst better than anything else, but care must be taken that the patient does not swallow a considerable quantity of fluid in this way.

During the next few days the diet should be small in amount, unstimulating, and should not contain an excessive amount of fluid; $1\frac{1}{2}$ pints of milk, and 3 or 4 oz. of toast and butter, and an egg or shredded meat sandwiches

will be ample, and should be taken cold and in small quantities at a time.

The diet should be increased on the third or fourth day after the attack and the original diet may in most cases be resumed in ten days' time. The following diet which was taken by a patient with hæmoptysis on the fourth day after the attack is a good example of the kind of diet we prescribe.

8 a.m.		One egg beaten up with milk, 1 oz. Toast, 1 oz., buttered.
10 a.m.		Raw meat sandwich, bread, 1 oz.; meat 1 oz.; butter.
12 noon		Custard pudding, 3 oz.
2 p.m.		Benger's food, 3 oz.
4 p.m.		Pounded chicken or fish, 3 oz. Bread or potatoes, 1 oz.
6 p.m.		Milk and casumen, 2 oz. Toast, 1 oz., buttered.
8 p.m.		Poached egg on toast.
10 p.m.		Junket, custard, 3 oz.
2 a.m.		Benger's food, 3 oz.
4 a.m.		Milk and casumen, 4 oz.

Such a dietary is easily taken, has a very fair nutritive value, and is small in bulk. If the patient's condition is satisfactory it is advisable to continue the use of a diet of this kind, but gradually increasing the amount and the intervals for giving food, until the sputum is clear, at which date an ordinary diet can usually be safely resumed. Throughout the week or ten days following the hæmoptysis, and prior to the clearing up of the sputum, a careful watch should be kept upon the blood pressure, which can be controlled to a very considerable extent by careful dieting and the exhibition of saline purgatives. With a satisfactory low blood pressure the diet can often be gradually approximated to the normal diet before the sputum has completely cleared. Where there is much exhaustion or high fever a few days after the hæmoptysis, it is wiser to

increase the diet more rapidly, controlling the blood pressure as much as possible in other ways. In patients who have a succession of hæmorrhages, the dietetic indications are very similar, viz., the strength of the patient must be maintained at all costs, but at the same time the pulse rate and the blood pressure should be controlled as far as possible. It is impossible to lay down more precise instructions in the dietetic treatment for such cases.

Tuberculosis of the intestines.—The special indications in the treatment of this condition are :

1. To prevent irritation of the diseased area.
2. To prevent excessive peristalsis.

To fulfil these conditions the diet must be composed of food-stuffs which are fairly completely absorbed and leave only a small amount of unirritating residue ; the total bulk of food taken must be small and the diet fairly dry.

The following food-stuffs are of service in this condition :

Raw meat either in milk or better still in sandwiches ; raw meat is very readily absorbed and leaves little residue.

Underdone meat is suitable for the same reasons. Well done meat should be avoided as irritating fragments are apt to be left undigested.

Leube-Rosenthal meat solution is a very useful food-stuff in these cases ; half a tin may be given daily in addition to other meat.

Milk.—Milk should not be given in excessive amount as the hard curd which is frequently formed unless the milk has been specially prepared is apt to irritate. It is better to give a considerable proportion in the form of Benger's food which, when prepared, is partially digested and incapable of producing a hard curd ; or the milk may be pancreatized.

Eggs are most useful and should be used freely.

Cheese is a suitable food-stuff if carefully dissolved and the free acid neutralized by the aid of bicarbonate of soda ; the solution can then be used in the preparation of various savoury dishes.

Butter and cream should be given freely in place of much of the carbo-hydrate of the ordinary diet.

Bread is best taken toasted and plain biscuits may be given with advantage.

Most *puddings*, particularly the custards, blancmanges, creams and some milk puddings will be found satisfactory.

The following food-stuffs should be avoided :

Porridge, soups, potatoes, green vegetables and fruit (except in very small amounts), tea and coffee (except for flavouring). Casein preparations tend to set up diarrhoea and should be used very carefully.

Finally, food should be given in small quantity at fairly short intervals in the majority of cases.

The following dietary may be found useful and serves to illustrate the main points.

8 a.m.		Two eggs scrambled. Steamed fillet of fish, 2 oz. Toast, 2 oz. Butter, $\frac{1}{2}$ oz. Milk coffee, $\frac{1}{2}$ pt.
11 a.m.		Leube-Rosenthal meat solution.
1 p.m.		Underdone meat (minced) 3 oz., or raw meat sandwiches. Toast and biscuit, 2 oz., butter, $\frac{1}{2}$ oz. Blancmange, milk pudding, etc., 5 oz. with cream, $2\frac{1}{2}$ oz. Tumbler of milk.
4 p.m.		Milk tea, $\frac{1}{2}$ pt. (or Benger's food). Toast, 2 oz. Butter, $\frac{1}{2}$ oz., egg.
7.30 p.m.		Steamed fish, 2 oz. Underdone meat, 3 oz. Toast, 2 oz. Butter, $\frac{1}{2}$ oz.

Sweet pudding, 5 oz., with cream, $2\frac{1}{2}$ oz.,
or cheese custard.

10 p.m. Benger's food, $\frac{1}{2}$ pt., or Leube-Rosenthal
meat solution.

Approximate nutritive value of above dietary: Protein, 163;
Fat, 165; Carbo-hydrate, 220; Calories, 3,100.

SUPERVISION OF PATIENTS' DIETS

It is a very important matter, in the treatment of tuberculosis, to make sure that the diet prescribed for any patient is taken properly. When insisting that a patient should eat the whole amount of food ordered for him, it is absolutely essential that the diet be most carefully constructed. Undoubtedly diets are often prescribed which are obviously too large, on the principle that the patient will certainly leave some of the food. This is a very unsatisfactory method of trying to make sure that a patient takes an adequate diet; at the best, it is quite haphazard, and, indeed, often fails in its object. It is clearly far more satisfactory to work out very carefully the necessary diet; the physician can then with confidence urge upon the patient the necessity for taking it all. As a matter of fact, the necessary diet is by no means a big one, and can be readily taken by the ordinary patient, whereas the sight of a very large diet disheartens him. In sanatorium practice, it is best to practise those people who serve the prescribed meals in determining the weights of various food-stuffs. If the meals are weighed regularly for a little time, the eye gets very well trained to various weights, and diets of definite nutritive values can thus be readily given as prescribed. In private practice, we advise patients to buy a light pair of French scales and, at first, to

weigh out the various food-stuffs, as prescribed, very carefully. After a little practice, patients become sufficiently experienced to guess the amounts with quite sufficient accuracy to ensure the taking of the prescribed amounts. If patients are in the habit of leaving a material amount of their meals, what is left should also be weighed and recorded by some responsible person. The mere fact that such a record is kept, is often a very wholesome stimulus to the patient.

DIRECTIONS FOR THE PREPARATION OF CERTAIN FOODS USEFUL IN THE TREATMENT OF ANOREXIA, HIGH FEVER, DYSPHAGIA, ETC.

Milk Bovril.

Milk may be completely disguised by making "Invalid Bovril," or other meat extract preparation, as directed upon the bottles, but using boiling milk instead of water.

Milk Tea.

Place several teaspoonfuls of tea in a hot jug and pour upon them three or four tablespoonfuls of boiling water; stand three minutes and add a pint of boiling milk; stand another minute and then strain off the leaves and serve.

Milk fortified with sugar of milk is too sweet for the liking of most tuberculous patients, but the carbo-hydrates may be increased considerably by fortifying with starch.

Milk fortified with Starch.

Ingredients : Milk, 1 pint, cornflour, arrowroot or farina, 2 oz., Benger's liquor pancreaticus, 1 teaspoonful.

Mix the cornflour into a thin paste with a little milk,

boil the rest of the milk and pour it upon the mixed corn-flour, stirring continually until the whole mass thickens. Now add the liquor pancreaticus, stirring continually until the preparation is as thin as ordinary milk, which should occur in 1 or 2 minutes. The preparation is immediately boiled to prevent further change occurring. Essence of lemon, etc., tea, coffee, bovril, etc., may be used for flavouring.

Milk fortified with Casumen or other Soluble Casein.

Ingredients : Milk, 1 pint, 3 tablespoonfuls ($\frac{1}{3}$ oz.) moderately heaped of casumen.

Mix the casumen with the milk by dredging the powder into the milk while stirring and bring to boiling point, stirring vigorously all the time to prevent "burning."

It is possible to get double this amount of casumen into solution but this process requires more care.

This fortified milk may be used for the preparation of the cornflour above mentioned or the milk may be flavoured with tea, coffee, cocoa, bovril, Benger's food, etc., or may be taken as it is.

Milk fortified with Casein.

The most palatable result is obtained by adding dilute HCl to 1 pint of separated milk in sufficient amount to precipitate the casein; then strain through muslin and wash well to free the precipitate from lactose and acid. Dissolve in the required amount of new milk ($1\frac{1}{2}$ or 2 pints) with the aid of a small quantity of soda bicarbonate and warmth.

Meat Juice with Milk.

Ingredients : $\frac{3}{4}$ lb. rump steak or fillet of beef free from fat, 1 pint of milk, bovril or Brand's essence to flavour.

Pass the steak through a fine mincing machine or scrape very finely, this gives 7 oz. of meat pulp. Mix thoroughly with the milk and pass through a fine strainer or muslin, not a hair sieve. This should yield about a pint of fluid of the consistency of cream. Half a teaspoonful of bovril or some Brand's essence may be used for flavouring. Care should be taken to squeeze as much meat pulp as possible through the strainer. The preparation may be warmed by standing in a vessel of hot water, but excessive heating causes coagulation.

Meat Solution.

Leube-Rosenthal meat solution, to be obtained of Messrs. Poths and Co., of 4, Berry Court, St. Mary Axe, E.C., at 20s. per doz. $\frac{1}{2}$ lb. tins.

Two or three teaspoonfuls should be stirred with a very little hot water in a wineglass and the glass filled with Burgundy or port according to medical direction. The preparation may be served at any desired temperature. Half a tin of this solution may be taken daily.

Raw Meat Sandwiches.

Scrape finely a sufficient amount of fillet of beef, pound it in a mortar, adding pepper, salt, and any flavouring such as bovril or some sauce. Cut very thin bread and butter and make as thick a sandwich as possible. One oz. of bread should be sufficient for $1\frac{1}{2}$ –2 oz. of meat and $\frac{1}{2}$ oz. of butter.

Albumin Water.

Beat up the whites of two eggs without making froth, add 14 oz. of water and $\frac{1}{2}$ glass of sherry. Flavour with lemon and essence of lemon. A few crystals of citric acid may be added if the patient suffers greatly from thirst.

Sugar, etc., to taste. Put the fluid into a Sparklet syphon and aerate. This is useful when high fever is present.

Artificial Koumiss.

Ingredients : 3 quarts skimmed milk, 1 quart butter-milk, 6 oz. sugar. A small amount of yeast is occasionally required.

Keep at a temperature of 80° Fah. until separation commences, then bottle in Sparklet syphon.

Milk may be still further fortified with cream to the extent of 2 oz. of single cream to the pint without making the milk too rich. This is useful when vomiting is very persistent.

The following preparations are specially useful in dysphagia.

1. Custards. Heat $\frac{1}{2}$ pint of milk and add 2 beaten up eggs and stir until thick. The milk used may contain milk casein at the rate of 1 tablespoonful to the pint or may have been previously flavoured with meat extract, e.g. invalid bovril, in which case a savoury custard results.

2. Cheese custard. Dissolve 2 oz. of old cheese grated in $\frac{1}{2}$ pint of milk with the aid of a pinch of bicarbonate of soda and gentle heat. Make into a custard with eggs in the usual way and bake.

3. Velvet soup. Clear soup or stock (without salt) containing a tablespoonful of casumen to the pint, should have one or two beaten eggs stirred in when very hot immediately before serving.

4. Steamed fish. Place a few scraps of butter on a fillet of fish, cover with grease paper and cook between two plates for 15 to 20 minutes. Fish so treated is practically a semi-solid.

5. Scrambled eggs. Use four eggs and $\frac{1}{2}$ oz. of butter for each meal.

6. Creams and blancmanges made with gelatin are much better taken by patients with dysphagia than those thickened with farinaceous materials.

7. One third of an oz. of gelatin will thicken milk sufficiently to make it possible for the patient to take it satisfactorily when plain milk can only be taken with great pain.

8. Egg and milk is sometimes more easily taken if slightly thickened with gelatin.

9. Benger's food may be made of any degree of consistency, while milk fortified with casein may be used instead of plain milk.

10. Junket is frequently well taken but should be prepared shortly before it is required.

11. Typhoid bread and milk is frequently appreciated by patients. Boil half a round of bread without crust in half a pint of milk for 10 minutes, strain through fine muslin and ^sserve.



